CLAIMS

1. An engine for converting thermal energy to stored energy, the engine including:

(a) a thermal energy converter including an expansion chamber which is adapted to vary in volume by the movement of a movable wall forming one part of said expansion chamber, said expansion chamber capable of performing an expansion-contraction cycle;

(b) a working fluid in said expansion chamber which expands upon being heated whereby to displace the movable wall in a first direction to expand the volume of said expansion chamber and contracts upon being cooled to displace the movable wall in an opposed direction to reduce the volume of said expansion chamber;

(c) a temperature modifier adapted to draw on:

(i) a heat source to heat the working fluid to expand the volume of the expansion chamber by the displacement of the expansion wall to increase the volume of said expansion chamber as a first expansion part of said cycle; and

(ii) a cooling source to cool the working fluid to reduce the volume of the expansion chamber and to permit the return of the movable wall as a second part of said cycle; and

(d) pressure storage means operatively associated with said movable wall and adapted to deliver pressurised fluid to an accumulator means, said accumulator means for storing said pressurised fluid at an elevated pressure,

wherein said accumulator means is capable of being bled of said pressurised fluid at a predetermined rate such that the accumulated said elevated pressure is maintained at a minimum threshold level, irrespective of the irregularity of the movement of said movable wall.

2. An engine according to claim 1, wherein said heat source is an external source of fluid with a temperature above 39C.

3. An engine according to claim 2, wherein said external source of fluid is a by-product or waste product of an industrial or mechanical process.

4. An engine according to claim 1, wherein the regularity and speed of the movement of said movable wall is influenced by the difference between the temperatures of said heating and cooling sources and the stage of said cycle.

5. An engine according to claim 1, wherein a first predetermined dwell time precedes each expansion part of said cycle.

6. An engine according to claim 1 or 5, wherein a second predetermined dwell time precedes each contraction part of said cycle.

7. An engine according to claim 1, wherein said pressure storage means includes a storage piston operatively coupled to said movable wall and further includes pressure intensification means whereby the surface area of said movable wall is greater than the surface area of said storage piston.

8. An engine according to claim 1, wherein said engine includes a plurality of thermal energy converters arranged in parallel to charge said accumulator means with said pressurised fluid.

9. An engine according to claim 8, wherein said plurality of thermal energy converters operate independently of one another.

10. An engine according to claim 8, wherein the operation of said plurality of thermal energy converters is coordinated to deliver a relatively consistent supply of pressurised fluid to said accumulator means.

11. An engine according to claim 10, wherein said plurality of thermal energy converters are controlled by pressure switch means to determine selectively the heating or cooling of said working fluid.

12. An engine according to claim 10, wherein each said movable wall of said plurality of thermal energy converters is in the form of a converter piston and is mechanically linked by a rocker arrangement to determine selectively the heating or cooling of said working fluid.

13. An engine according to claim 12, wherein said heating and cooling sources are sources of hot and cold fluid, respectively, and the delivery of said hot and cold fluid to said plurality of thermal energy converters is controlled by valve switching means to determine selectively the heating or cooling of said working fluid in each said converter.

14. An engine according to claim 1, wherein said working fluid is a refrigerant.

15. An engine according to claim 1, wherein said pressurised fluid is a hydraulic oil.

16. An engine according to claim 1, wherein said engine is adapted to power work output means by the process of bleeding said pressurised fluid to drive a generator or an alternator.

17. An engine according to claim 16, wherein said alternator generates alternating current suitable for powering work output means in the form of appliances adapted to be powered by mains electricity.

18. An engine according to claim 1, wherein said movable wall is a flexible membrane.

19. An engine according to claim 18, wherein said pressure storage means forms part of said thermal energy converter and said expansion chamber is one compartment of said thermal energy converter separated from saidpressure storage means by said movable wall.